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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,635	08/02/2001	Alexander Ivanovich Taran	VALER11.001APC	1851

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Knobbe Martens
Olson & Bear
Sixteenth Floor
620 Newport Center Drive
Newport Beach, CA 92660

EXAMINER

NORRIS, JEREMY C

ART UNIT	PAPER NUMBER
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2841

DATE MAILED: 09/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

SUPPLEMENTAL
Office Action Summary

Application No.

09/830,635

Applicant(s)

TARAN, ALEXANDER IVANOVIC

Examiner

Jeremy C. Norris

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-36 and 46-57 is/are rejected.
- 7) ☒ Claim(s) 37-45 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because of the use of the phrase "The invention relates to". Correction is required. See MPEP § 608.01(b).

Drawings

The drawings are objected to because the sectional views are not fully cross-hatched (see MPEP 608.02). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 24-26, 30, and 46-48 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,100,475 (hereafter Degani).

Degani discloses, referring to figure 5, a contact node comprising: at least two metallized contacts (16, 27) coupled with conductive paths arranged on surfaces of connection layers made on the base of a dielectric material and mutually aligned and interconnected electrically and mechanically by a conductive binding material (26) ,

Art Unit: 2827

wherein it is made in the form of a joint between a contact made in the form of a metallized contact pad (27) coupled with the conductive paths on the surface of the connection layer, and a respective contact joined with the contact pad and made in the form of a metallized hole (15) in an upper-lying connection layer, the lower edge of the metallized hole being faced to the metallized contact pad on the surface of the underlying connection layer, and the upper edge of the hole being coupled with the conductive paths (21) on the upper surface of the upper-lying connection layer [claim 24], wherein the metallized hole is in the form of a cylinder [claim 25], wherein the upper edge of the metallized hole coupled with the conductive paths on the surface of the connection layer forms a metallized rim along the periphery of the edge [claim 26], wherein the metallized contact pad is flat [claim 30], wherein the upper and lower edges of the metallized hole have a facet [claim 46].

Similarly, Degani discloses, referring to figure 3, a contact node, comprising: a first connection layer (41) having a conductive path on a surface thereof; a second connection layer (42) deposited adjacent to the first connection layer having a conductive path on a surface thereof; and a metallized hole (43) provided through the first connection layer and having an inner surface thereof connected to the conductive path of the first connection layer; and a metallized contact pad provided on the surface of the second connection layer and connected with the conductive path of the second connection layer, wherein a conductive binding material (45) is deposited in the metallized hole to be in contact with the inner surface of the metallized hole and the metallized contact pad so as to form connection between the first and second

connection layers [claim 47], wherein the metallized hole is in a form of a cylinder [claim 48].

Claims 24, 27-31, 34, 35, 46, 47, 49, 53, and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,087,597 (hereafter Shimada).

Shimada discloses, referring to figure 2, a contact node comprising: at least two metallized contacts coupled with conductive paths arranged on surfaces of connection layers made on the base of a dielectric material and mutually aligned and interconnected electrically and mechanically by a conductive binding material (13), wherein it is made in the form of a joint between a contact made in the form of a metallized contact pad (31) coupled with the conductive paths on the surface of the connection layer, and a respective contact joined with the contact pad and made in the form of a metallized hole (23) in an upper-lying connection layer, the lower edge of the metallized hole being faced to the metallized contact pad on the surface of the underlying connection layer, and the upper edge of the hole being coupled with the conductive paths (24) on the upper surface of the upper-lying connection layer [claim 24], wherein the metallized hole is made in the form of a truncated cone, the lower base of the truncated cones being faced to the contact pad on the surface of the underlying connection layer, and the upper base of the truncated cones being coupled with the conductive paths on the upper surface of the upper-lying connection layer [claim 27], wherein the upper edge of the metallized hole coupled with the conductive paths on the surface of the connection layer forms a metallized rim long the periphery of the edge [claim 28], wherein an integrated circuit chip (41) oriented by its metallized contact pads

to the corresponding metallized holes in the upper-lying connection layer is used as a connection layer with the metallized contact pads respective to the metallized holes in the upper-lying connection layer [claim 29], wherein the metallized contact pad is flat [claim 30], further comprising a protrusion (31) interacting with the respective metallized hole formed in the center of the metallized contact pad respective to the metallized hole [claim 31], wherein the protrusion is in the form of a sphere (see col. 2, lines 20-30) [claim 34], wherein the protrusion is made of a conductive material (see col. 3, lines 30-35) [claim 35], wherein the upper and lower edges of the metallized hole have a facet [claim 46].

Similarly, Shimada discloses, referring to figure 2, a contact node, comprising: a first connection layer (21) having a conductive path on a surface thereof; a second connection layer (30) deposited adjacent to the first connection layer having a conductive path on a surface thereof; and a metallized hole (23) provided through the first connection layer and having an inner surface thereof connected to the conductive path of the first connection layer; and a metallized contact pad (31) provided on the surface of the second connection layer and connected with the conductive path of the second connection layer, wherein a conductive binding material (13) is deposited in the metallized hole to be in contact with the inner surface of the metallized hole and the metallized contact pad so as to form connection between the first and second connection layers [claim 47], wherein the metallized contact pad has a metallized protrusion (11) in a form of a sphere (see col. 2, lines 20-30) in the conductive binding

material [claims 49, 54], wherein the metallized hole is in a form of a truncated cone [claim 53].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 32, 33, 36, 50-52 and 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada.

Regarding claims 32, 33, 50-52 and 55-57, Shimada discloses the claimed invention as described above except Shimada does not specifically state that the protrusion is in the form of a cylinder [claims 32, 51, 56], cone [claims 33, 50, 55] or rod [claims 52, 57]. However, Shimada does teach that any shape may be used for the protrusion (see col. 7, lines 10-20). The Examiner takes Official Notice that cylinder, cone, and rod are known and well defined shapes. Therefore, it would have been

obvious, to one having ordinary skill in the art, at the time of invention, to use any of the rod, cylinder, or cone shapes as the shape for the protrusion in the invention of Shimada. The motivation for doing so would have been to utilize the shape that most facilitates insertion into the corresponding through hole (see Shimada, col. 7, lines 15-20).

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada in view of US 5,729,440 (hereafter Jimarez).

Shimada discloses the claimed invention as described above except Shimada does not specifically state that the protrusion is made of a solder. However, Shimada teaches that the protrusion may formed from any metal as long as the melting point of the metal is higher than the melting point of the joining solder (stated to be ~ 180° C). There are many high-temperature solders having melting points higher than this amount known in the art as evidenced by Jiminez (see col. 3, lines 5-15). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to use a high temperature solder that is known in the art, as evidenced by Jiminez, as the material for the core in the invention of Shimada. The motivation for doing so would have been to use a known material having suitable solidity at the liquidous temperature of the joining solder.

Allowable Subject Matter

Claims 37-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 37 states the limitation "further comprising a contact made in the form of a rod fixed in the underlying connection layer orthogonally to its surface inserted into the metallized hole". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. Claim 44 states the limitation "wherein the diameter D of the upper base of the truncated cone, the width h of the metallized rim, the diameter d of the lower base of the truncated cone, the thickness t of the dielectric material of the connection layer and the minimal width L of the respective metallized contact pad on the underlying connection layer are coupled with the following relationship: $L \geq D + 2h = d + 2t + 2h$ ". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 5,920,123 Moden,

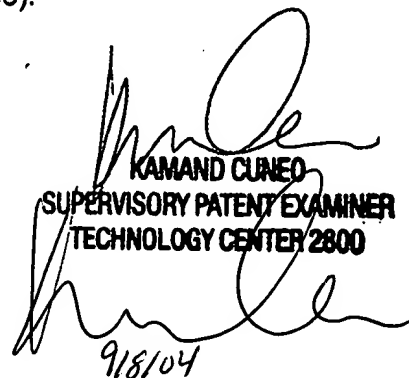
US 6,010,769 Sasaoka et al.,
US 6,013,877 Degani et al.,
US 6,054,761 McCormack et al..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JCSN


KAMAND CUNEO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800
9/8/04